# CLAIMS

1. A method for producing methane gas from organic wastes, comprising:

treating organic wastes with at least one of supercritical water and sub-critical water to convert the organic wastes into low molecular weight substances; and

subjecting the low molecular weight substances to methane fermentation.

2. The method according to claim 1, wherein the treatment for conversion into low molecular weight substances is a treatment with sub-critical water.

3. The method according to claim 1, wherein in the treatment with sub-critical water, a treatment temperature is 440 to 553 K, and a treatment pressure is 0.8 to 6.4 MPa.

4. The method according to claim 1, wherein a time taken for the treatment for conversion into low molecular weight substances is 1 to 20 minutes.

5. The method according to claim 1, wherein the treatment for conversion into low molecular weight substances is performed continuously.

6. The method according to claim 1, further comprising separating a water phase from the treated substances, so that the water phase is subjected to methane fermentation.

7. The method according to claim 6, wherein the water phase contains organic acid.

8. The method according to claim 7, wherein the organic acid includes acetic

acid.

9. The method according to claim 1, wherein a time for the methane fermentation is in a range of 5 to 48 hours.

10. The method according to claim 1, wherein carbon digestion efficiency in the methane fermentation is 90% or more.

11. The method according to claim 1, wherein the organic waste is activated sludge.

12. The method according to claim 1, further comprising separating and collecting a useful material generated in the treatment for conversion into low molecular weight substances.

13. The method according to claim 12, wherein the useful material generates at least one of phosphoric acid, organic acid, fatty acid, amino acid, and sugar.

14. The method according to claim 12, wherein by adjusting at least one of a treatment temperature and a treatment time in the treatment for conversion into low molecular weight substances, the useful material is allowed to be generated selectively.